SEQUENCE LISTING

SEQ 1: *Arabidopsis thaliana GAD1*

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121  gcggcgtatc agatcatcaa cgacgagctg atgcttgacg ggaatccacg gttgaactta
181  gcctcctttg tgacgacatg gatggagcct gagtgtgata aactcatcat gtcctccatc
241  aacaagaact atgttgacat ggacgagtac cccgtcacca ccgaacttca gaaccgatgt
301  gtgaacatga ttgcacatct attcaatgca ccgttagaag aggcggagac cgccgtcgga
361  gtaggaaccg ttggatcatc ggaggccata atgttggccg gtttggcctt caagcgtaaa
421  tggcagaaca agcgcaaagc tgaaggcaaa cccgtcgata aacccaacat tgtcaccgga
481  gccaatgttc aagtgtgttg ggagaaattc gctaggtact ttgaggttga acttaaggaa
541  gtgaaattga gtgaaggata ctatgtgatg gaccctcaac aagctgttga tatggttgat
601  gagaacacca tttgtgttgc ggacattctt ggttccactc ttaatggaga attcgaagat
661  gttaaactct tgaacgatct cttggtcgaa aagaacaaag aaaccggatg ggatacacca
721  atccacgtgg atgcggcaag tggaggattc attgcaccgt ttttgtatcc ggaattggaa
781  tgggacttta gacttccctt ggtgaagagt atcaatgtga gtggtcacaa gtatggactt
841  gtgtacgcag ggattggttg ggtgatctgg agaaacaaag aggatttgcc tgaggaactc
901  atcttccata tcaattatct tggtgctgac caacccacct ttactctcaa tttctccaaa
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1141 aaagatagca gctgtcacac tgagttcgaa atctccgaca tgcttcgcag gtatggatgg
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1261 atcagagaag atttctcgag aacactcgct gagagacttg tgatcgatat agagaaagtg
1321 atgcgtgagc tcgatgagct tccttcgaga gtgattcaca aaatatcact tggacaagag
1381 aagagtgaat ctaacagcga taacttgatg gtcacggtga agaagagcga tatcgacaag
1441 cagagagata tcatcactgg ctggaagaag tttgtcgccg acaggaagaa gacgagtggt
1501 atctgctaa
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SEQ2: *Arabidopsis thaliana* GAD1

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RKWQNKRKAEGKPVDKPNIVTGANVQVCWEKFARYFEVELKEVKLSEGYYVMDPQQAVDMVDENTICVA
DILGSTLNGEFEDVKLLNDLLVEKNKETGWDTPIHVDAASGGFIAPFLYPELEWDFRLPLVKSINVSGH
KYGLVYAGIGWVIWRNKEDLPEELIFHINYLGADQPTFTLNFSKGSSQVIAQYYQLIRLGHEGYRNVME
NCRENMIVLREGLEKTERFNIVSKDEGVPLVAFSLKDSSCHTEFEISDMLRRYGWIVPAYTMPPNAQHI
TVLRVVIREDFSRTLAERLVIDIEKVMRELDELPSRVIHKISLGQEKSESNSDNLMVTVKKSDIDKQRD
IITGWKKFVADRKKTSGIC
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SEQ 3: *Arabidopsis thaliana GAD2*

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121  gataccgaaa gacgctgcat atcagatcat aaaagatgag ctgatgcttg atggtaaccc
181  gaggcttaac ctagcttcgt ttgtgactac atggatggaa ccagagtgtg acaaactcat
241  catggactct atcaacaaga actacgttga tatggatgag taccctgtca caactgagct
301  ccagaaccga tgtgtaaaca ttatagcttcg actgttcaat gcgccactcg aggaatctga
361  gacggcggtg ggagtaggga cagttggttc ttcagaagcc atcatgttag ccggattggc
421  cttcaaaaga aaatggcaga acaaacgcaa ggctgagggt aaaccctatg acaaacccaa
481  cattgtcact ggagccaatg ttcaagtttg ctgggagaaa ttcgctcggt acttcgaggt
541  ggagctaaag gaagtaaacc taagtgaagg ttactacgtg atggatccag acaaagcagc
601  agaaatggta gacgagaaca caatctgtgt cgcagccata ttgggatcca cactcaacgg
661  tgagttcgaa gacgtgaaac gtctcaatga cttgctagtc aagaaaaacg aggagactgg
721  ttggaacaca ccgatccacg tggatgcagc aagtggaggg ttcatagctc cgtttatcta
781  tcctgaatta gaatgggact ttagacttcc tttggttaag agtatcaacg tgagtggtca
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841 caagtatgga ctggtctatg ctggtattgg ttgggtcgtg tggagggcag cagaggattt
901 gcctgaagag cttatctttc atattaatta tcttggtgct gatcaaccca ctttcactct
961 caatttctcc aagggatcga gccaaattat tgctcaatac taccagctca ttcgtcttgg
1021 attcgagggg tacaaaaatg tgatggagaa ttgcatagag aacatggtgg ttctcaaaga
1081 agggatagag aaaacagagc gtttcaacat agtctcaaag gaccaaggag tgccagtcgt
1141 agccttctct ctcaaggacc atagtttcca caacgagttc gagatctctg agatgctacg
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1381 aatagaaggg atcgcggaaa atgtaaagga gaagaagatg gagaaggaga ttctgatgga
1441 agttattgtt ggatggagga agtttgtgaa ggagaggaag aagatgaatg gtgtgtgcta
1501 agcaagtgtg ttgcctttgt gtggaaatga agaggtactt gcgaggactt tgcgtttatc
1561 agtttatgtg tttgtatatc tatttgatcc agttattatg gattatatac gcttgaaact
1621 cattttaagc cattgttatt gaacgtttat caaatacttt attat

SEQ 4: *Arabidopsis thaliana* GAD2

MVLTKTATNDESVCTMFGSRYVRTTLPKYEIGENSIPKDAAYQIIKDELMLDGNPRLNLASFVTTWMEP
ECDKLIMDSINKNYVDMDEYPVTTELQNRCVNIIARLFNAPLEESETAVGVGTVGSSEAIMLAGLAFKR
KWQNKRKAEGKPYDKPNIVTGANVQVCWEKFARYFEVELKEVNLSEGYYVMDPDKAAEMVDENTICVAA
ILGSTLNGEFEDVKRLNDLLVKKNEETGWNTPIHVDAASGGFIAPFIYPELEWDFRLPLVKSINVSGHK
YGLVYAGIGWVVWRAAEDLPEELIFHINYLGADQPTFTLNFSKGSSQIIAQYYQLIRLGFEGYKNVMEN
CIENMVVLKEGIEKTERFNIVSKDQGVPVVAFSLKDHSFHNEFEISEMLRRFGWIVPAYTMPADAQHIT
VLRVVIREDFSRTLAERLVADISKVLHELDTLPSKISKKMGIEGIAENVKEKKMEKEILMEVIVGWRKF
VKERKKMNGVC

SEQ 5: *Arabidopsis thaliana GAD3*

ATGGTTTTATCTAAGACAGCTTCCAAATCCGATGATTCAATCCATTCAACTTTTGCTTCCCGTTATGTC
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GAGTTCTAAAACTTAGCCTAGACGACGATACACAGCATCTTGATTCTAGATTCAATATTTATTACAGAA
ATATTTATTTTTAATATACGATATAGTTCCAGATTTTAATTTTTGGGTACATAAGAAAGAATACTAGAT
TCTAACGAAATTAACCACTTGCACTGAAAGATCCGAGCATAATGTGTGTTACTATATAAGAGGTATTTT
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TCGAGGTAAATAATAACTCAATAAAGAAACTAAAACGTTACTAAATCCAATCGTATACGTACTAGTATA
ATATACAAGTTGTTACTATACTTTATGACTACAAAAGTTCAAAACCAAGAATGTACTAAATACATTCCA
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TAGGGATATCGCAACGTGATGGATAATTGCCGCGAGAACATGATGGTACTAAGACAAGGATTAGAGAAA
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AGCCGCCACAACGAGTTCGAGGTGGCCGAAATGCTTCGTCGCTTCGGCTGGATCGTTCCGGCCTACACG
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GCTGAGAGATTGGTAGCCGATTTCGAGAAGGTTCTACACGAGCTCGATACGCTTCCCGCGAGGGTTCAC
GCCAAGATGGCTAGTGGAAAAGTTAACGGTGTTAAGAAGACGCCAGAGGAGACGCAAAGAGAAGTCACG
GCCTACTGGAAGAAGTTTGTGGACACTAAGACTGACAAGAACGGCGTTCCGTTAGTAGCAAGTATTACC
AATCAATGA

SEQ 6: *Arabidopsis thaliana* GAD3

MVLSKTASKSDDSIHSTFASRYVRNSISRFEIPKNSIPKEAAYQIINDELKFDGNPRLNLASFVTTWME
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RQWQNKRKALGLPYDRPNIVTGANIQVCLEKFARYFEVELKEVKLREGYYVMDPDKAVEMVDENTICVV
AILGSTLTGEFEDVKLLNDLLVEKNKKTGWDTPIHVDAASGGFIAPFLYPDLEWDFRLPLVKSINVSGH
KYGLVYAGIGWVVWRTKTDLPDELIFHINYLGADQPTFTLNFSKGSSQVIAQYYQLIRLGFEGYRNVMD
NCRENMMVLRQGLEKTGRFNIVSKENGVPLVAFSLKDSSRHNEFEVAEMLRRFGWIVPAYTMPADAQHV
TVLRVVIREDFSRTLAERLVADFEKVLHELDTLPARVHAKMASGKVNGVKKTPEETQREVTAYWKKFVD
TKTDKNGVPLVASITNQ

SEQ 7: *Arabidopsis thaliana GAD4*

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ACATGTAATGATGTAAACCTTGGATAGTTTTTTTTTTGGCCGTGGTTAATGTTGTAGATTTATTATGTG
TTATATACTATAAGGAAGGACATGTTTCGTTATTTTAACTTAATGTATCATCATTTCATCATTAGATTC
GAAATGCCTGAGAACTCAATCCCAAAAGAAGCAGCTTACCAAATCATCAACGACGAGCTAATGCTCGAT
GGTAACCCAAGGCTGAACCTAGCTTCCTTCGTGACCACATGGATGGAGCCAGAATGTGACAAGCTCATG
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AATTTCCGGTTCAATACAGGTTTGCTGGGAGAAATTCGCAAGGTATTTCGAAGTGGAGCTTAAGGAAGT
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TTGTGTCGCTGCCATCCTCGGTTCAACGTTAACCGGTGAATTCGAAGACGTTAAGCTCCTCAACGACCT
CCTTGTCGAGAAAAACAAGCAAACCGGGTAATTAAACCAAACCGAGAAACAAGCTAATATCGATTGTAA
TCGGTTTGGAGTCCGGTTTTAACGTTCTAAAACACAATTTGCAGATGGGACACGCCAATACACGTGGAC
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GTTAAGAGTATTAATGTGAGTGGTCACAAATACGGTTTGGTTTACGCCGGTATTGGTTGGGTTGTATGG
AGAACCAAAACCGATTTGCCTGATGAACTTATCTTCCATATCAATTATCTTGGCGCTGATCAACCAACC
TTTACACTCAACTTCTCCAAAGGTACATTACCATAAGTCCATAACATATATAACTTTCAATAATATTTT
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TACCAAATGGTCAATAAAGAAACTAGAATGTATTATATTTAAGTTGTTACTTGTTACTATACTTTGAAT
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CACAACGAGTTCGAGGTGGCCCATACACTCCGTCGCTTCGGCTGGATCGTTCCGGCCTACACGATGCCT
GCGGATGCGCAGCATGTCACTGTCCTTCGAGTTGTTATCCGAGAAGATTTCTCTCGAACCTTAGCCGAG
AGATTGGTAGCTGATTTCGAGAAGGTTCTACACGAGCTCGATACGCTTCCGGCGAGGGTTCACGCCAAG
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SEQ 8: *Arabidopsis thaliana* GAD4

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RQWQNKRKAQGLPYDKPNIVTGANVQVCWEKFARYFEVELKEVNLREDYYVMDPVKAVEMVDENTICVA
AILGSTLTGEFEDVKLLNDLLVEKNKQTGWDTPIHVDAASGGFIAPFLYPELEWDFRLPLVKSINVSGH
KYGLVYAGIGWVVWRTKTDLPDELIFHINYLGADQPTFTLNFSKGSSQVIAQYYQLIRLGFEGYRNVMD

NCRENMMVLRQGLEKTGRFKIVSKENGVPLVAFSLKDSSRHNEFEVAHTLRRFGWIVPAYTMPADAQHV
TVLRVVIREDFSRTLAERLVADFEKVLHELDTLPARVHAKMANGKVNGVKKTPEETQREVTAYWKKLLE
TKKTNKNTIC

SEQ 9: *Arabidopsis thaliana GAD5*

ATGGTACTCGCAACCAACTCTGACTCCGACGAGCATTTGCATTCCACTTTTGCTTCTAGATATGTCCGT
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ATATATTTAATTATTTATGTATCTGTTTGCATATATTGAAACAGGTTCAAGATGCCTGACCATTGCATG
CCCAAAGATGCTGCTTATCAAGTGATCAATGATGAGTTGATGCTTGATGGTAATCCCAGGCTTAACCTA
GCCTCCTTTGTCACCACTTGGATGGAACCTGAGTGTGACAAACTCATCATGGATTCTGTCAATAAGAAC
TATGTTGATATGGATGAATATCCTGTCACCACTGAGCTCCAGGTTCCTCCTTCTTTCCTCTCATTCTCT
CTCTCATCTACTTTCCACTGTTTTGTCATAGACTCATACATCTTTTATCTGGCTTATTTTTCAGAACCG
GTGTGTAAATATGATAGCAAACTTGTTCCATGCTCCCGTTGGAGAAGACGAGGCTGCTATTGGGTGTGG
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AAAAGCTCAGGGTCTACCTATTGATAAGCCTAACATTGTCACTGGAGCCAATGTTCAGGTCTAAAATAT
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TTGAACGATCTCTTAGCTGAGAAAAACGCAGAGACAGGATGGGAAACTCCTATTCATGTTGATGCAGCC
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TGAAGACTGCCAAGATGTCCTTGGAGGATATCACTAAGTATTGGAAACGCCTTGTGGAACACAAGAGAA
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SEQ 10: *Arabidopsis thaliana* GAD5

MVLATNSDSDEHLHSTFASRYVRAVVPRFKMPDHCMPKDAAYQVINDELMLDGNPRLNLASFVTTWMEP
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KWQHRRKAQGLPIDKPNIVTGANVQVCWEKFARYFEVELKEVKLSEDYYVMDPAKAVEMVDENTICVAA
ILGSTLTGEFEDVKQLNDLLAEKNAETGWETPIHVDAASGGFIAPFLYPDLEWDFRLPWVKSINVSGHK
YGLVYAGVGWVVWRTKDDLPEELVFHINYLGADQPTFTLNFSKGSSQIIAQYYQFIRLGFEGYKNIMEN
CMDNARRLREGIEMTGKFNIVSKDIGVPLVAFSLKDSSKHTVFEIAESLRKFGWIIPAYTMPADAQHIA
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SEQ 11: Tobacco *NtGAD1*

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181  accaaaggaa gcagcatatc aaatcataaa tgatgagctt atgttagatg gaaatccaag
241  actaaattta gcatcttttg tgacaacatg gatggaacca gagtgtaaca aactgatgat
301  ggattccatt aacaagaatt acgttgacat ggatgaatac cctgtaacca ctgaacttca
361  gaatcgatgt gtaaacatga tagctcattt gtttaacgca ccacttggag atggagagac
421  tgcagttgga gttggaactg ttggatcctc tgaggctatt atgcttgctg gattagcttt
481  caagagaaaa tggcaaaata aaatgaaagc ccaaggcaag ccctgtgaca agcccaatat
541  tgtcactggt gccaatgtcc aggtgtgttg ggagaaattt gcaaggtatt ttgaagtgga
601  gctaaaggaa gtaaagttga gtgatggata ctatgtgatg gaccctgaga aagctgtgga
661  aatggtggat gagaacacaa tttgtgtagc tgctatcttg ggttccacac tcaatggtga
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841  agagcttgaa tgggacttta gattgccatt ggtgaagagt ataaacgtga gtggtcacaa
901  atatggtctt gtttatgctg gtattggttg ggccatttgg aggaataagg aagacttacc
961  tgacgaactt atcttccaca ttaattatct tggtgctgat caacctactt tcactctcaa
1021 cttctctaaa ggttctagcc aagtaattgc tcaatattac caacttattc gcttgggttt
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1561 atttaattta acaaaatatg tttataatta atatgatgat ttataactac tagcagtggt
1621 actgcttgtt tttatatttg aattgttggg ttttttgagt atgaggagct agctatttat
1681 tgctagtgaa atattggttg aaaaa
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SEQ 12: Tobacco NtGAD1

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RKWQNKMKAQGKPCDKPNIVTGANVQVCWEKFARYFEVELKEVKLSDGYYVMDPEKAVEMVDENTICVA
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KYGLVYAGIGWAIWRNKEDLPDELIFHINYLGADQPTFTLNFSKGSSQVIAQYYQLIRLGFEGYKNVME
NCQENARVLREGLEKSGRFNIISKEIGVPLVAFSLKDNSQHNEFEISETLRRFGWIIPAYTMPPNAQHV
TVLRVVIREDFSRTLAERLVIDIEKVLHELDTLPARVNAKLAVAEANGSGVHKKTDREVQLEITTAWKK
FVADKKKKTNGVC
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SEQ 13: Tobacco *NtGAD2*

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1    tattttcatt ttctctcctg ttttaatttc tgatcttctc cgtcgtacta ccaccactac
61   gccgccatgg ttctgtccaa gacagcgtcg gaaagtgacg tctccgttca ctccactttc
121  gcctcccgat atgttcgaac ttctcttccc aggtttaaaa tgccagagaa ttcaatacca
181  aaggaagcag catatcagat tataaatgat gagcttatgt tagatggaaa tccaaggcta
241  aatttagcat ctttcgttac aacatggatg gagccagaat gtaatacgtt aatgatggat
301  tccattaaca agaactacgt tgacatggat gaataccctg taaccactga gcttcagaat
361  cgatgtgtaa atatgatagc tcatttgttt aatgcaccac ttggagatgg agagactgca
421  gttggagttg gaactgttgg atcctctgaa gctattatgc ttgctggatt agcctttaag
481  agaaaatggc aaaataaaat gaaagcccaa ggcaagccct ttgataagcc caatattgtc
541  accggtgcta atgtccaggt gtgttgggag aaatttgcaa ggtattttga agtggagttg
601  aaagaagtaa aattgagtga tggatactat gtgatggacc ctgagaaagc tgtggaaatg
661  gtggatgaga ataccatttg tgttgctgct atcttaggtt caacactcaa tggtgaattt
721  gaagatgtta agcgtttgaa tgacctttg attgagaaga acaaagaaac cgggtgggac
781  actccaattc atgtggatgc agcaagtggt ggatttattg caccattcct ttatccagag
841  cttgaatggg actttagatt gccattggag aagagtatta atgtgagtgg tcacaaatat
901  ggtcttgtct atgctggtat tggttgggcc atttggagga ataaggaaga cttgcctgat
961  gaacttattt tccacatcaa ttaccttggt gctgatcaac ctactttcac tctcaacttc
1021 tctaaaggtt ctagccaagt aattgctcaa tattaccaac ttattcgctt gggttttgag
1081 ggttacaaga atgttatgga gaattgtcaa gaaaatgcaa gggtattaag agaaggaatt
1141 gaaaaaagtg gaagattcaa cataatctcc aaagaaattg gagttccctt agtagcattt
1201 tctcttaaag acaacagtca acacaatgag ttcgaaattt ctgaaactct tagaagattt
1261 ggatggattg ttctggcata tactatgcca ccaaatgctc aacatgtcac agttctcaga
1321 gttgtcatta gagaagattt ctcccgcaca ctagcggagc gactggtaat agacattgaa
1381 aaagtcttcc acggagtaga cacacttccg gcgagggtca acgctaagct agccgtggcc
1441 gaggcgaatg gcagcggcgt gcataagaaa acagatagag aagtgcagct agagattact
1501 actgcatggt tgaaatttgt tgctgataag aagaagaaga ctaatggagt ttgttaattt
1561 aatttaacaa aaaaaaagtt tataatatgg tgatttatgt aactactagc agtcgtactg
1621 cttgtttttt atatttgagt tgatgtgttt tttgagcact tgaggagcta gctagttatt
1681 gctagtgaaa aattggatga tatattttgg actactttgt aagtttgtat tattaatcca
1741 aattaaacga tatttatcat aaaaaaaaaa a
```

SEQ 14: Tobacco NtGAD2

MVLSKTASESDVSVHSTFASRYVRTSLPRFKMPENSIPKEAAYQIINDELMLDGNPRLNLASFVTTWME
PECNTLMMDSINKNYVDMDEYPVTTELQNRCVNMIAHLFNAPLGDGETAVGVGTVGSSEAIMLAGLAFK
RKWQNKMKAQGKPFDKPNIVTGANVQVCWEKFARYFEVELKEVKLSDGYYVMDPEKAVEMVDENTICVA
AILGSTLNGEFEDVKRLNDLLIEKNKETGWDTPIHVDAASGGFIAPFLYPELEWDFRLPLEKSINVSGH
KYGLVYAGIGWAIWRNKEDLPDELIFHINYLGADQPTFTLNFSKGSSQVIAQYYQLIRLGFEGYKNVME
NCQENARVLREGIEKSGRFNIISKEIGVPLVAFSLKDNSQHNEFEISETLRRFGWIVLAYTMPPNAQHV
TVLRVVIREDFSRTLAERLVIDIEKVFHGVDTLPARVNAKLAVAEANGSGVHKKTDREVQLEITTAWLK
FVADKKKKTNGVC

SEQ 15: Petunia *GAD*

1 aaagagtaca aactaatatc cacttaaatt gtatttctcc attttctctc tttatttagt
61 ctgtcataac aatggttcta tcaaagacag tgtcgcagag cgatgtgtcc attcactcca
121 cgtttgcttc tcgatatgtt cgaacttctc ttcccaggtt taaaatgcca gataattcga
181 taccaaaaga agcagcatat cagatcataa atgatgaact gatgttagat ggaaacccaa
241 ggctgaactt ggcttctttt gttacaacat ggatggaacc agagtgtgat aagttgatga
301 tggactctat taacaagaac tatgttgata tggatgaata tcctgttacc actgagcttc
361 agaatcgatg tgtaaacatg atagctcatt tgtttaatgc accacttgaa gatggagaaa
421 ctgcagttgg agttggaact gttggatcct ctgaagccat tatgcttgct ggattagctt
481 tcaagagaaa atggcagaac aaaatgaaag cccaaggcaa accctgtgac aagcccaaca
541 ttgttactgg tgcaaatgtc caggtgtgct gggagaaatt tgcaaggtat tttgaagtgg
601 agctaaagga agtaaagctt agtgaaggat actatgtgat ggaccctgag aaagctgtgg
661 agatggtgga tgaaaacacc atttgtgtag ctgctatctt aggttccacc ctcaatggag
721 aatttgaaga cgttaagcgc ttgaatgatc tcttggtcga gaagaacaaa gaaaccgggt
781 gggacactcc aattcatgtg gatgcagcaa gtggtggatt tattgcaccg ttcatttacc
841 cagagcttga gtgggacttt agattgccat tagtgaagag cattaatgta agtggtcaca
901 aatatggtct tgtctatgct ggtattggtt gggtcgtttg gaggaacaag atgatttgc
961 ctgatgaact tatcttccac attaattatc ttggtgctga tcaacctact ttcactctca
1021 acttttctaa aggttctagc caagtaattg ctcaatatta ccaacttatt cgcttgggtt
1081 atgagggtta caagaatgtg atggagaatt gtcaagaaaa tgcatcggta ctaagagaag
1141 ggctagaaaa gacaggaaga ttcaacataa tctccaaaga aattggagta cctttagtag
1201 cattctctct taaagacaac aggcaacaca acgagttcga gatttctgaa actttaagga
1261 gatttggttg gattgttcct gcatatacta tgccaccaaa cgcacaacac attacagttc
1321 tcagagttgt gatcagagaa gatttctccc gtacgcttgc agaacgactg gtaagagaca
1381 tcgaaaaagt ccttcatgaa cttgacacac tccctgcacg tgtcaatgct aagctcgctg
1441 tggccgagga gcaggcggct gcgaatggca gcgaggtgca taagaaaaca gatagcgaag
1501 tgcagttgga gatgataact gcatggaaga agtttgttga agaaaagaag aagaagacta
1561 atcgagtttg ttaattaatt atattagtgt ttataatatg atgaatatgg ctattatcat
1621 tggtgactgc ttgttagtat attagctgtg attatcacca atatgagttt ggttttcttg
1681 atttggttct tttcagtact tgaaaagttg ttattgatat tgtaaaattg tacttttaa
1741 ctatttggat tattaatgcc aattttctag tgtacttaat aaaaa

SEQ 16: Petunia GAD

MVLSKTVSQSDVSIHSTFASRYVRTSLPRFKMPDNSIPKEAAYQIINDELMLDGNPRLNLASFVTTWME
PECDKLMMDSINKNYVDMDEYPVTTELQNRCVNMIAHLFNAPLEDGETAVGVGTVGSSEAIMLAGLAFK
RKWQNKMKAQGKPCDKPNIVTGANVQVCWEKFARYFEVELKEVKLSEGYYVMDPEKAVEMVDENTICVA
AILGSTLNGEFEDVKRLNDLLVEKNKETGWDTPIHVDAASGGFIAPFIYPELEWDFRLPLVKSINVSGH
KYGLVYAGIGWVVWRNKDDLPDELIFHINYLGADQPTFTLNFSKGSSQVIAQYYQLIRLGYEGYKNVME
NCQENASVLREGLEKTGRFNIISKEIGVPLVAFSLKDNRQHNEFEISETLRRFGWIVPAYTMPPNAQHI
TVLRVVIREDFSRTLAERLVRDIEKVLHELDTLPARVNAKLAVAEEQAAANGSEVHKKTDSEVQLEMIT
AWKKFVEEKKKKTNRVC

SEQ 17: Tomato *GAD*

```
1    aaaaaatggt gttaacaacg acgtcgataa gagattcaga agagagcttg cactgtacat
61   ttgcatcaag atatgtacag gaacctttac ctaagttcaa aatgcctaaa aaatccatgc
121  cgaaagaagc agcttatcag attgtaaacg acgagcttat gttggatggt aaccccaggt
181  tgaatttagc ttccttttgtt agcacatgga tggagcccga gtgcgataag ctcatcatgt
241  catccattaa taaaaactat gtcgacatgg atgagtatcc tgtcaccact gaacttcaaa
301  atagatgtgt taacatgtta gcacatcttt tccatgcccc ggttggtgat gatgagactg
361  cagttggagt tggtacagtg ggttcatcag aggcaataat gcttgctggc cttgctttca
421  aacgcaaatg gcaatcgaaa agaaaagcag aaggcaaacc tttcgataag cctaatatag
481  tcactggagc taatgtgcag gtctgctggg aaaaatttgc aaggtatttt gaggttgagt
541  tgaaggaggt gaaactaaaa gaaggatact atgtaatgga ccctgccaaa gcagtagaga
601  tagtggatga gaatacaata tgtgttgctg caatccttgg ttctactctg actggggagt
661  ttgaggatgt gaagctccta aacgagctcc ttacaaaaaa gaacaaggaa accggatggg
721  agacaccgat tcatgtcgat gctgcgagtg gaggatttat tgctcctttc ctctggccag
781  atcttgaatg ggatttccgt ttgcctcttg tgaaaagtat aaatgtcagc ggtcacaagt
841  atggccttgt atatgctggt gtcggttggg tgatatggcg gagcaaggaa gacttgcccg
901  atgaactcgt ctttcatata aactaccttg ggtctgatca gcctactttt actctcaact
961  tctctaaagg ttcctatcaa ataattgcac agtattatca gttaataaga cttggctttg
1021 agggttataa gaacgtcatg aagaattgct tatcaaacgc aaaagtacta acagagggaa
1081 tcacaaaaat ggggcggttc gatattgtct ctaaggatgt gggtgttcct gttgtagcat
1141 tttctctcag ggacagcagc aaatatacgg tatttgaagt atctgagcat ctcagaagat
1201 ttggatggat cgtccctgca tacacaatgc caccggatgc tgaacacatt gctgtactgc
1261 gggttgtcat tagagaggat ttcagccaca gcctagctga gagacttgtt tctgacattg
1321 agaaaattct gtcagagttg gacacacagc ctcctcgttt gcccaccaaa gctgtccgtg
1381 tcactgctga ggaagtgcgt gatgacaagg gtgatgggct tcatcatttt cacatggata
1441 ctgtagagac tcagaaagac attatcaaac attggaggaa aatcgcaggg aagaagacca
1501 gcggagtctg ctaggtctgg ccacacttgt tatctgggct ccgcttccat cgccatcctg
1561 tagtatgtat tacgtgtgtt gtttccatct tatgtagtag ttggtactgt aatctgtgta
1621 aatgctttca tgatcttggc tctgtatatg ctaaataagc actgcatttc aagttcctgg
1681 aagtatttat gtatgaatca atccgggcat aattggtaga atgccctctc tgcgtcatct
1741 ttgaatttca cgtgcaataa tatttgaaat ctacacctat tat
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SEQ 18: Tomato GAD

```
MVLTTTSIRDSEESLHCTFASRYVQEPLPKFKMPKKSMPKEAAYQIVNDELMLDGNPRLNLASFVSTWM
EPECDKLIMSSINKNYVDMDEYPVTTELQNRCVNMLAHLFHAPVGDDETAVGVGTVGSSEAIMLAGLAF
KRKWQSKRKAEGKPFDKPNIVTGANVQVCWEKFARYFEVELKEVKLKEGYYVMDPAKAVEIVDENTICV
AAILGSTLTGEFEDVKLLNELLTKKNKETGWETPIHVDAASGGFIAPFLWPDLEWDFRLPLVKSINVSG
HKYGLVYAGVGWVIWRSKEDLPDELVFHINYLGSDQPTFTLNFSKGSYQIIAQYYQLIRLGFEGYKNVM
KNCLSNAKVLTEGITKMGRFDIVSKDVGVPVVAFSLRDSSKYTVFEVSEHLRRFGWIVPAYTMPPDAEH
IAVLRVVIREDFSHSLAERLVSDIEKILSELDTQPPRLPTKAVRVTAEEVRDDKGDGLHHFHMDTVETQ
KDIIKHWRKIAGKKTSGVC
```

1) *Arabidopsis thaliana* ecotype Columbia glutamate decarboxylase 1 (GAD1) cDNA

Note: This is nucleic acid SEQ #1 and amino acid SEQ #2

A) LOCUS ATU10034
ACCESSION U10034
VERSION U10034.1 GI:497978
REFERENCE

AUTHORS Arazi,T., Baum,G., Snedden,W.A., Shelp,B.J. and Fromm,H.
TITLE Molecular and biochemical analysis of calmodulin interactions with the calmodulin-binding domain of plant glutamate decarboxylase
JOURNAL Plant Physiol. 108 (2), 551-561 (1995)

1. From Arabidopsis genome sequencing project chromosome 5 (ACC# AB005238)
LOCUS BAB10520
DEFINITION glutamate decarboxylase 1 (GAD 1) (*Arabidopsis thaliana*)

ACCESSION BAB10520
PID g10177078
VERSION BAB10520.1 GI:10177078
REFERENCE 1 (sites)
AUTHORS Sato,S., Kotani,H., Nakamura,Y., Kaneko,T., Asamizu,E., Fukami,M., Miyajima,N. and Tabata,S.
TITLE Structural analysis of Arabidopsis thaliana chromosome 5. I. Sequence features of the 1.6 Mb regions covered by twenty physically assigned P1 clones
JOURNAL DNA Res. 4 (3), 215-230 (1997)

2) *Arabidopsis thaliana* ecotype Columbia glutamate decarboxylase 2 (GAD2) cDNA

Note: This is nucleic acid SEQ #3 and amino acid SEQ #4

A) LOCUS ATU46665
ACCESSION U46665
VERSION U46665.1 GI:1184959
REFERENCE
AUTHORS Turano,F.J. and Fang,T.K.
TITLE Characterization of two glutamate decarboxylase cDNA clones from Arabidopsis
JOURNAL Plant Physiol. 117 (4), 1411-1421 (1998)

B) LOCUS ATU49937
ACCESSION U49937
VERSION U49937.1 GI:1236618
REFERENCE
AUTHORS Zik,M., Arazi,T., Snedden,W.A. and Fromm,H.
TITLE Two isoforms of glutamate decarboxylase in Arabidopsis a regulated by calcium/calmodulin and differ in organ distribution
JOURNAL Plant Mol. Biol. 37 (6), 967-975 (1998)

C) From Arabidopsis genome sequencing project
ACCESSION #AC009513
Part of chromosome # 1
note="Identical to gb|U46665 glutamate decarboxylase 2 (GAD 2) *Arabidopsis thaliana*. and ESTs gb|W43856, gb|N37724, gb|Z34642 and gb|R90491 come from this gene."
/protein_id="AAF06056.1"
/db_xref="GI:6227020"

3) *Arabidopsis thaliana* ecotype Columbia putative glutamate decarboxylase (putative GAD3) DNA From Arabidopsis genome sequencing project

Note: This is nucleic acid SEQ #5 and amino acid SEQ #6

ACCESSION #AC006532
Part of chromosome #2
/product="putative glutamate decarboxylase"
/protein_id="AAD20093.1"
/db_xref="GI:4406783"

4) *Arabidopsis thaliana* ecotype Columbia putative glutamate decarboxylase (putative GAD4) DNA From Arabidopsis genome sequencing project

Note: This is nucleic acid SEQ #7 and amino acid SEQ #8

ACCESSION #AC006532
Part of chromosome #2
/product="putative glutamate decarboxylase"
/protein_id="AAD20099.1"
/db_xref="GI:4406789"

5) *Arabidopsis thaliana* ecotype Columbia putative glutamate decarboxylase (putative GAD5) DNA From Arabidopsis genome sequencing project

Note: This is nucleic acid SEQ #9 and amino acid SEQ #10

ACCESSION #AB026646
Part of chromosome #3
/evidence=not_experimental
/product="glutamate decarboxylase"
/protein_id="BAB02870.1"
/db_xref="GI:9294589"

6) Tobacco (*Nicotiana tabacum*) glutamate decarboxylase isozyme 1 (NtGAD1) cDNA

Note: This is nucleic acid SEQ #11 and amino acid SEQ #12

A) LOCUS AF020425
ACCESSION AF020425
VERSION AF020425.1 GI:3252855
REFERENCE
AUTHORS Yun,S.J. and Oh,S.H.
TITLE Cloning and characterization of a tobacco cDNA encoding calcium/calmodulin-dependent glutamate decarboxylase
JOURNAL Mol. Cells 8 (2), 125-129 (1998)

B) LOCUS NTU54774
ACCESSION U54774
VERSION U54774.1 GI:1777920
REFERENCE
AUTHORS Dharmasiri,M.A.N., Lu,Y.T. and Harrington,H.M.
TITLE Cloning and sequencing of a tobacco cDNA encoding glutamate decarboxylase
JOURNAL Unpublished

7) Tobacco (*Nicotiana tabacum*) glutamate decarboxylase isozyme 2 (NtGAD2) cDNA

Note: This is nucleic acid SEQ #13 and amino acid SEQ #14

LOCUS AF020424
ACCESSION AF020424
VERSION AF020424.1 GI:3252853
REFERENCE 1 (bases 1 to 1771)
AUTHORS Yun,S.J. and Oh,S.H.
TITLE Cloning and characterization of a tobacco cDNA encoding calcium/calmodulin-dependent glutamate decarboxylase
JOURNAL Mol. Cells 8 (2), 125-129 (1998)

8) Petunia (*Petunia hybrida*) glutamate decarboxylase cDNA

Note: This is nucleic acid SEQ #15 and amino acid SEQ #16

2. LOCUS PETGADX
ACCESSION # L16797
VERSION # L16797.1 GI:294111
KEYWORDS glutamate decarboxylase.
REFERENCE
AUTHORS Baum,G., Chen,Y., Arazi,T., Takatsuji,H. and Fromm,H.
TITLE A plant glutamate decarboxylase containing a calmodulin binding domain: cloning, sequence, and functional analysis
JOURNAL J. Biol. Chem. 268, 19610-19617 (1993)

B) LOCUS PETGLUDECA

ACCESSION L16977

VERSION L16977.1 GI:309679
REFERENCE
AUTHORS Baum,G., Chen,Y., Arazi,T., Takatsuji,H. and Fromm,H.
TITLE A plant glutamate decarboxylase containing a calmodulin-binding domain: cloning sequence and functional analysis
JOURNAL J. Biol. Chem. (1993)

9) Tomato (*Lycopersicon esculentum*) glutamate decarboxylase-like protein LEGDL cDNA

Note: This is nucleic acid SEQ #17 and amino acid SEQ #18

ACCESSION X80840
VERSION X80840.1 GI:993002
REFERENCE
AUTHORS Gallego,P.P., Whotton,L., Picton,S., Grierson,D. and Gray,J.E.
TITLE A role for glutamate decarboxylase during tomato ripening: the characterization of a cDNA encoding a putative glutamate decarboxylase with a calmodulin-binding site
JOURNAL Plant Mol. Biol. 27 (6), 1143-1151 (1995)